

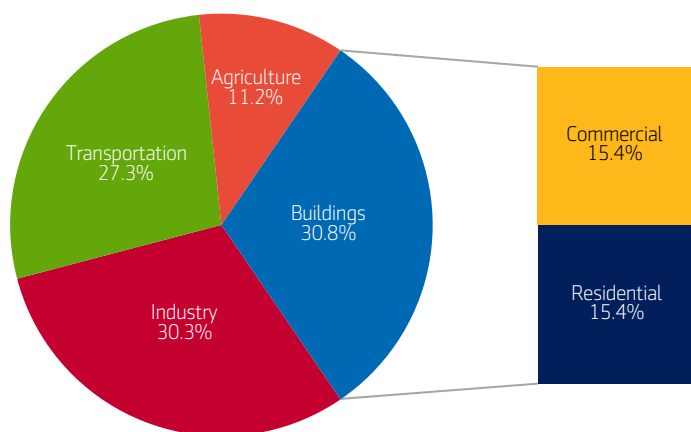
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In order to prevent catastrophic climate change, the US and other nations across the world have pledged to reduce greenhouse gas emissions enough to keep global warming beneath 2 degrees Celsius. Residential buildings currently contribute approximately 15% of the greenhouse gas emissions produced by the US and reducing those emissions as much as possible is critically important.¹ Though misaligned incentives have prevented many multifamily property owners from making substantial investments in energy retrofits, it is possible to make energy-efficiency improvements both cost effective and financially beneficial. As government regulations and mandates for energy efficiency become more commonplace, it is increasingly important to make energy efficiency a priority before inefficiency becomes a costly liability.

Reduce greenhouse gas emissions

The US has committed to climate goals of reducing net greenhouse gas emissions by 50% from 2005 levels by 2030, creating a carbon pollution-free power sector by 2035, and achieving net-zero emissions economy-wide by 2050. In 2020, the US emitted 5,981 million metric tons of CO₂ equivalent greenhouse gas emissions and offset 758 million metric tons, creating a net total of 5,222 million metric tons. The US will need to reduce that to 3,323 million by 2030 in order to meet the first goal. Buildings typically contribute approximately 31% of those emissions, with residential energy use typically contributing approximately 15% of total US emissions, through both direct emissions and emissions created through electricity usage (exhibit 1). In 2020, residential properties produced approximately 923 million metric tons of CO₂ equivalent greenhouse gas emissions. Those emissions will need to be reduced to 624 million by 2030 to meet the goal of 50% reduction from 2005 levels.¹

Exhibit 1: Sources of 2020 CO₂ Emissions



Source: US Environmental Protection Agency, April 2022. Numbers may not add up exactly due to rounding.

Improved building technology and standards, combined with an electric grid system that emits less greenhouse gases as it moves away from coal, has enabled the residential sector to decrease CO₂ equivalent emissions by 26% between 2005 and 2020, while the number of residential units has increased by 12%.^{2,3} Though the energy efficiency of new buildings is an important way to prevent increasing CO₂ emissions, increasing the efficiency of existing buildings is crucial to the goal of actually reducing CO₂ emissions.

Energy retrofits on older properties will have more impact on reducing CO₂ emissions than building new properties with zero-operating emissions because of the embodied carbon that new construction requires.⁴ Embodied carbon is defined as “the greenhouse gasses generated during the extraction, manufacture, and transportation of building materials, and during construction and disposal.”⁵ It takes between 10 and 80 years for the improved operations of new energy-efficient buildings to overcome the negative impacts of the greenhouse gases created through the construction process.⁶ Therefore, building reuse has more positive environmental impacts than new construction, even if the reused building has less energy efficient operations. Additionally, energy retrofits to existing buildings create immediate reductions in climate change producing emissions.

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The opportunity to reduce carbon emissions through energy retrofits in existing multifamily rental buildings is vast. According to CoStar, there are 67,219 multifamily rental buildings (with at least 50 units) in the US built before the year 2000. Less than 14% of those properties have been renovated in the past 20 years.⁷

Decrease financial risk

Investment in energy-efficient building improvements should reduce energy expenses and therefore pay for themselves over time. However, since tenants of multifamily properties usually pay for their own energy usage, most cost savings would accrue to them rather than to the building owner. These misaligned incentives have prevented many multifamily property owners from investing in energy saving improvements.⁸

Rather than expend the capital necessary to replace aging mechanical systems with newer, more energy-efficient systems, many landlords pay to repeatedly repair systems that are nearing the end of their useful life. Continuing this patch-work method of property management is misguided for multiple reasons. The ongoing costs of responding to system failures over time can be significant. HVAC system outages and inadequate insulation and weatherization can lead to tenant dissatisfaction and higher tenant turnover. Unnecessarily high energy bills cause economic stress for tenants that can lead to non-payment of rent. Over time the value of the property will likely be negatively impacted by its energy-inefficiency as government requirements become stricter and investors become increasingly concerned with meeting ESG goals.⁹

In contrast, investing in extensive energy retrofits can increase a property’s value and improve returns for investors.⁹ The trend toward green leases helps to bridge the gap that the traditionally misaligned incentives created. With green leases, tenants can share the cost burden of energy-efficient investments through charges in addition to rent that are less than the cost savings they will receive in the form of reduced utility bills.⁸ The soaring energy prices that we have seen recently (exhibits 2 and 3) make this approach increasingly relevant. Additionally, when tenants have less to pay in utilities, they are more likely to pay their rent. Census data indicates that renters that have fallen behind on energy bills are more likely to have fallen behind on rent.¹⁰ It stands to reason that when tenants pay less for utility bills, they could be more able to absorb rent increases over time. Other possible benefits of improved energy efficiency include reduced maintenance costs, greater levels of comfort for occupants, and improved health and safety.¹¹

Exhibit 2: Change in Prices for US Average Electricity per KWH

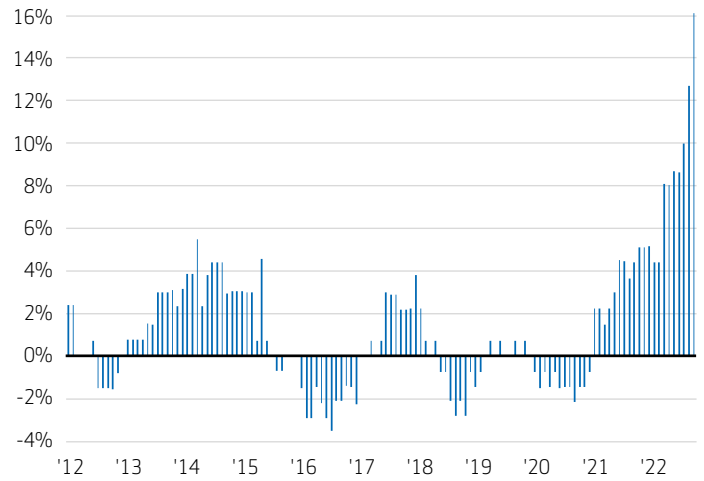
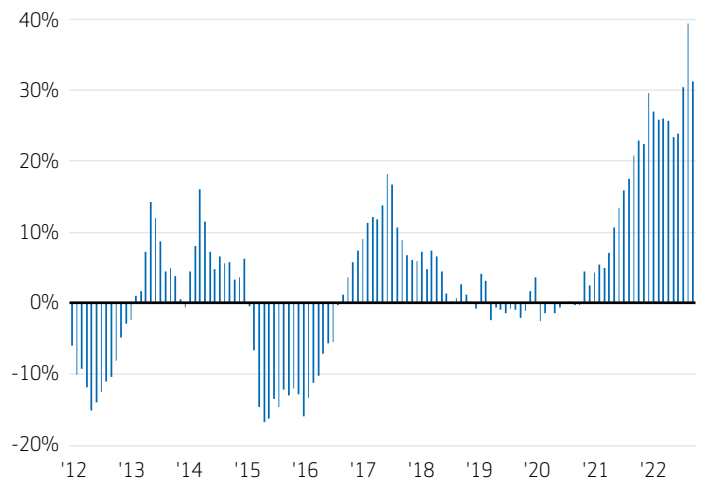


Exhibit 3: Change in Prices for US Average Utility (piped) gas per Therm



Source: Bureau of Labor Statistics. July 2022.

Energy efficiency can also be translated into various energy labels that can provide renter’s comparable and credible information on the energy efficiency of prospective apartments. These scores may help attract renters and raise the amount of rent they are willing to pay. A recent study found that including these energy labels on rental listings could affect renters’ preferences and that on average, renters were willing to pay 1.8% more in rent for each one-unit increase in energy score on a simple one-to-ten scale.¹² Other studies have shown that green certifications can produce rent premiums of 3% to 8%.⁹

Beyond these effects, multiple studies have shown that there is a correlation between energy efficiency and the

risk of commercial mortgage defaults. Inefficient buildings that require more energy for operations are subject to more volatility in net operating income (NOI) and the corresponding debt-service coverage ratio (DSCR), which creates greater risk of mortgage default. Increasing occurrences of extreme temperatures that require more energy for heating or cooling in combination with increasing volatility in energy prices will make the cost of inefficiency riskier over time.¹³ Lenders are beginning to take energy efficiency into account when setting mortgage terms. A recent study of properties owned by REITs found that buildings with environmental certifications had mortgage rates 24 to 29 basis points lower than buildings without certifications. As lenders become more aware of the default risk associated with poor energy efficiency and adjust the cost of debt accordingly, the value of energy-efficient buildings will grow.⁹

The opportunity to reduce carbon emissions through energy retrofits in existing multifamily rental buildings is vast with less than 14% of multifamily rental buildings having been renovated in the past 20 years.⁷

Prevent regulatory risk

Increasingly stringent climate-related regulations on commercial real estate from state and local government is a further real concern as discussed in a recent report from Green Street.¹⁴ The report points out that government entities under pressure to meet ambitious greenhouse gas reduction commitments see commercial real estate, which by definition cannot leave the jurisdiction, as a primary target for increased regulation. Examples of such regulations are in place in multiple cities and are expected to become more common across the country.

For example, New York City recently enacted Local Law 97, which aims to reduce citywide building emissions by 80% by 2050. Commercial and residential buildings will need to meet increasingly strict emissions caps over time, with the deadline for meeting the initial limits in 2024.¹⁵ In another example, the City of Denver recently passed an ordinance that requires commercial and multifamily buildings to reduce energy usage by 30% by 2030, with interim goals in 2024 and 2027.¹⁶ Washington DC, Boston, St Louis and multiple cities in California have also passed measures aimed at reducing emissions from commercial real estate.¹⁷

The Green Street report points out that the first step towards local efficiency mandates is usually disclosure requirements

and limits on emissions for municipal buildings. These steps can be considered leading indicators for future requirements of commercial real estate. According to Green Street, 76% of the top 50 US markets have enacted emissions limits for municipal buildings.

Capitalize on incentives

The Inflation Reduction Act signed into law in August includes expanded tax credits for building owners and developers to make energy-efficiency improvements. Under the new law, the maximum benefit for the pre-existing 179D Energy Efficient Buildings Tax Deduction will more than double in 2023, from \$1.88 per square foot to \$5.00 per square foot. We believe this will make energy upgrades and retrofits more cost effective than ever.¹⁸

There are also other incentives from states, local governments, and utility providers that make energy retrofits more affordable and cost effective. Incentives can come in the form of tax credits, deductions, or exemptions, rebate programs, grants, and loans. These financial incentives can cover a wide variety of improvements such as installation of on-site-renewal energy, electrification, geothermal heating and cooling, heat pumps, charging station for electric vehicles, insulation and weatherization improvements, lower energy appliances, LED lighting, water efficient fixtures, and energy management systems.

Importance of cost-benefit expertise

Not all energy upgrades are appropriate for every property. The energy savings that can be achieved, both in terms of dollars and CO2 emissions, are dependent on the details of the property, the local climate, and the specifics of the electric grid the property is connected to. A property subject to extreme hot or cold temperatures will benefit more from particular HVAC upgrades or weatherization improvements than a property in a more temperate climate. Not all electric grids are equal in terms of greenhouse gas emissions.¹⁹ Some electric grids still rely heavily on coal, and therefore energy-efficiency upgrades connected to those grids would create greater reductions in greenhouse gas emissions. Properties connected to electric grids that rely on nuclear, hydro, or renewable energy might see less benefits from energy retrofits in terms of greenhouse gas reductions. The dollar savings would be dependent on the local energy market, which is dependent on a variety of factors and varies widely. The availability of local incentives can also have a strong impact on the cost-benefit equation. Additionally, the existing condition of each property

requires and allows for different types of improvements. In order to extract the greatest benefits from capital invested in energy efficiency it is imperative to have a deep understanding of building mechanics and energy systems, local energy markets, and local incentive programs.

Despite these differences in property characteristics and locations, a review of a sizeable set of 179 multifamily properties located across the US offers some insight into cost-benefit results. The properties were built mostly after 1970 with the median year of construction in 1983. All underwent energy and water retrofit projects during the 2009-2012 period under HUD's Green Retrofit Program. Projects were designed specific to each property and included a variety of improvements covering water, light, building enclosures, cooling, appliances, ventilation, heating, window replacement, hot water, onsite power generation, and pumps and motors. On average, the retrofits achieved total energy savings of 18% and total water savings of 26%. Projects were found to pay for themselves over their useful life.²⁰ Another study of 3,600 commercial and multifamily buildings in New York City that modelled financial returns to energy retrofit investments found a median internal rate of return of 21%.²¹

In order to extract the greatest benefits from capital invested in energy efficiency we believe it is imperative to have a deep understanding of building mechanics and energy systems, local energy markets, and local incentive programs.

Conclusion

Investors in multifamily properties would be wise to explore ways to increase energy efficiency in their properties. Not only is it good for the planet, but it is also good for the bottom line. Green leases can help distribute the cost of capital improvements to tenants, who reap the rewards of the investment in the form of reduced energy bills and improved comfort. Building owners benefit from happier and more financially secure tenants that are more likely to be able to absorb rent increases, as well as reduced maintenance costs and less volatility in energy costs. Government entities that have committed to ambitious climate goals see commercial real estate as primary means to achieving those goals. State and local governments are using both carrots and sticks to influence building owners. It is better to focus on making the most of government incentives to invest in energy upgrades upfront rather than being forced to pay a high cost down the road just to remain in compliance with new government regulations and mandates.

References

- ¹United States Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020. 2022.
- ²Proceedings of the National Academy of Sciences of the United States of America. The carbon footprint of household energy use in the United States. August 11, 2020.
- ³US Census Bureau. Housing Vacancies and Homeownership. December 31, 2021.
- ⁴Urban Land Institute. Embodied Carbon in Building Materials for Real Estate. 2022.
- ⁵Architectural Record. Continuing Education: Embodied Carbon and Adaptive Reuse. February 1, 2022.
- ⁶Preservation Green Lab. The Greenest Building: Quantifying the Environmental Value of Building Reuse. 2011.
- ⁷CoStar Realty Information, Inc. September 27, 2022.
- ⁸The Joint Research Centre. European Commission. Overcoming the split incentive barrier in the building sector. 2017.
- ⁹Pension Real Estate Association. The Value-Add of Going Green. September 2022.
- ¹⁰The American Council for an Energy-Efficient Economy. One Third Tenants Behind on Utility Bills, Highlighting Need for Energy Upgrades. August 17, 2022.
- ¹¹American Council for an Energy-Efficient Economy. Multiple Benefits of Multifamily Energy Efficiency for Cost-Effectiveness Screening. June 2015.
- ¹²The American Council for an Energy-Efficient Economy. Energy Labels Affect Behavior on Rental Listing Websites: A Controlled Experiment. May 2022.
- ¹³Trepp. Poor Energy Efficiency May Predict CMBS Default Risk. September 2017.
- ¹⁴Green Street. Keeping Track of "E" Regulations. August 8, 2022.
- ¹⁵Propmodo. Why NYC's Local Laws 97 Matters for Property Owners Everywhere. May 6, 2022.
- ¹⁶City and County of Denver. New Ordinance for Building Electrification. November 23, 2021.
- ¹⁷Commercial Property Executive. Building Performance Policies Across the US. March 4, 2022.
- ¹⁸GlobeSt. Inflation Reduction Act Doubles Tax Credits for Building Retrofits. August 19, 2022.
- ¹⁹Green Street. Grid 101. September 19, 2022.
- ²⁰Bright Power. Energy and Water Savings in Multifamily Retrofits. June 2014.
- ²¹Science Direct. Building Retrofit Hurdle Rates and Risk Aversion in Energy Efficiency Investments. January 15, 2022.

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